Demystifying the Semantic Web
First Generation of the Web

- Tim Berners Lee
- 1990’s …… Today
- Publishing & Retrieval of Information
- Google
2nd Generation = Semantic web

- **Semantic** = of or relating to meaning

- **Ontology/web** = Formal Vocabulary describes Relations between objects, groups, categories.

- **SW** = a vision of the web in which web document components describe and comprehend relationships between various aspects of web content.

‘Transforms web into a knowledge base’
Fragment Ontology of Family

Sisters

Sue

Betty

Jack

Betty = Jack's Aunt
Web pages Today

XML Describes what data is

Digital Certificates Trust

HTML How web pages look
How Will They Do That?

- Metadata: ‘information about information’
- XML: `<salary>$500 <wage>`
- RDF: resource description framework. ‘Describes Metadata’
- Key = simplicity = 3 pt Record “Triples”
- ‘resource, property, value’
- W3C Recommendation 1999.
Example of RDF

- `<rdf:Description about='http://www.EC512.com/EC/ILoveEC.html'> {Resource/subject}

- `<Title>`I Love EC`</Title> {Property/predicate}

- `<HomePage rdf:resource='http://www.EC512.com' />

- `Con = Lacks Expressiveness`
Darpa Agent Markup Language = DAML.

Description of Ontology.

Simple Sorts of Inferences like Humans.

DAML+OIL = richer.

Oil = Supports reasoning across ontologies. ‘Provides an inference layer’

Oil Can Relate Classes. class-def : person subclass-of : mammal

OWL = Ontology web language.

Isn’t this stuff cool?
DAML

- (motherOf subProperty parentOf) 
  (Sue motherOf Jack)
- when stated in DAML, allows you to conclude
- (Sue parentOf Jack) : Ontology

*Can Assert Facts Based on DAML Standard*
Web Services Today

SOAP messages

WSDL
Web Services

UDDI
Directory WS
Semantic Web Services

- XML/ SOAP/ WSDL/ UDDI
- DAML-S: DAML + Oil Ontology devoted to Web Services.
- Motivation = Complex Services.
- Goal = Automate: ‘Take human intervention out’
- Discovery: Adheres to constraints.
- Invocation: execution of identified service.
- Interoperation: ‘multiple users’
- Execution monitoring: where in the process the request is.

I don’t have to do a Thing!
The Class Service = Pet Food Depot.

Requester Wants Dog Food.

UDDI: Key Word Search Not Powerful Enough to Match.

DAML-S Profiles: Service Profile Can Express Dog Food Related Pet Food.
DAML-S “CLASS” Service Description: ‘Pet Food Depot’
‘descendant class’ Service Profile: ‘what the service does’
‘descendant class’ Service Model: ‘How the Service Works’
‘descendant class’ Service Grounding: ‘How an agent can access a service’

www.daml.org/services
SW Services Cliff hangar

- Work in Progress.

- SWSI: “a number of theoretical, methodological and empirical issues must be addressed.”

- Need Autonomy.


www.SWSI.org (semantic web services initiative)
What Does The Future Hold?

- Momentum
- SWOGGLE: Search & Metadata
- U of MD: CS & EE Research Project
  - 337,182 SW pages.
  - Defines 97,369 classes.
  - 54,369 properties.
  - Computes Ontology Ranks.
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